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RUCPDOC/DEPT OF COMMERCE WASHDC
RHMFIS/DEPT OF ENERGY WASHINGTON DC 0052
RULSDMK/DEPT OF TRANSPORTATION WASHINGTON DC 0030
RUEATRS/DEPT OF TREASURY WASH DC
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SENSITIVE
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STATE FOR EAP/CM, EB/ESC, OES/ENV, INR/EAP
STATE PASS EPA
BEIJING FOR FCS, ESTH AND DOE

E.O. 12958: N/A

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SUBJECT: "Fe" vs. Climate Change: China's BYD Bets on Batteries in Fight Against Global Greenhouse Gas Emissions

REF: GUANGZHOU 612

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¶1. (SBU) Summary and Comment: The answer to climate change may be as simple as the chemical formula of a lithium iron phosphate battery, according to one ambitious south China company. Referred to simply as "Fe" and already the key component of the world's first mass produced plug-in hybrid electric vehicle, top managers at Shenzhen-based battery and car manufacturer BYD envision this battery technology will have applications that go beyond use in electric vehicles (EVs). Backed by U.S. investor Warren Buffet and with annual revenue last year over US\$4 billion, BYD not only has plans to launch an all-electric vehicle in the near future but is also engaged in R&D related to the deployment of "Fe" batteries as energy storage devices for use alongside solar panels and wind turbines. In order to achieve its objective to lead the world in the production of EVs and EV batteries, BYD will first need to bring down battery cost and size, tackle the challenge of weak charging infrastructure, and address consumer safety concerns. BYD tentatively plans to offer its e6 all-electric vehicle in the U.S. in late 2010 but safety concerns and accusations that the company's conventional vehicle designs infringe on foreign copyrights (reftel) could result in legal challenges and complicate entry into the U.S. market. End Summary and Comment.

PLANS TO BECOME WORLD'S #1 CONVENTIONAL CARMAKER BY 2025

¶2. (SBU) BYD's seemingly boundless ambition may be at least partially rooted in the company's remarkable achievements in less than 15 years of operation. The list of BYD's accomplishments includes becoming the world's largest cell-phone battery manufacturers and growing its gasoline-powered vehicle business from 25,000 vehicles sold in 2005 to 450,000 sold in 2009. According to recent comments made by BYD Chairman Wang Canfu at a gathering of consular representatives in Guangzhou, BYD plans to propel itself to first position in China's conventional vehicle market by 2015 and become the world's largest producer of gasoline-powered vehicles by **¶2025**. (Comment: One pillar of BYD's success in China's conventional car market is a business model that relies on copying with minor

modifications the designs of foreign carmakers (reftel). End Comment.)

BYD RACING TO DEVELOP AFFORDABLE ELECTRIC VEHICLE

¶ 13. (SBU) Adding to its list of accomplishments, BYD became the first auto manufacturer in the world to mass produce a plug-in hybrid electric vehicle when it launched its F3 dual-mode (F3DM) in December 2008. The company claims the F3DM travels further with a single charge, about 68 miles, and costs less, around US\$22,000, than the plug-in hybrid Toyota Prius and Chevy Volt that are expected to hit the U.S. market in late 2010. During a recent visit to BYD headquarters in Shenzhen, a top manager told Congenoff that sales of the F3DM had been slow, with only around 100 vehicles sold to date, mostly to the municipal government. (Comment: Media reports speculate that slow sales may also be an indication that the F3DM's battery performance falls considerably short of expectations.

End Comment.) At the same time, the manager asserted that a recent central government initiative to offer subsidies to fleet purchasers of plug-in hybrids in 13 cities, including Beijing, Shanghai, and Shenzhen, would likely provide a boost to sales. The manager added that the extension of subsidies beyond fleet purchasers, i.e. government bureaus and taxi companies, to individual consumers would also increase demand, although he conjectured that most environmentally aware individuals interested in electric vehicles earn incomes that would disqualify them from receiving subsidies.

¶ 14. (SBU) Not deterred by slow sales of its plug-in hybrid, BYD has aggressive plans to move into and dominate the electric vehicle market. Company officials claim that the e6 all-electric vehicle, to be initially launched in Shenzhen, will be able to traverse 249 miles on a single charge, further than any other electric vehicle on

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the market or in production. Although company representatives did not specify the price of the e6, published reports place it at around US\$40,000. As with the F3DM, the core technology used in the e6 will be the "Fe" battery, which uses lithium iron phosphate (LiFePO4). BYD managers claim the "Fe" battery can be charged at special "fast-charge" stations to 50% in ten minutes and fully charged in about 90 minutes.

¶ 15. (SBU) The company expects to sell 100 e6 vehicles in the months following the initial launch to local taxi companies, with a portion of the purchase price to be defrayed by subsidies from the Shenzhen municipal government. A recent Wall Street Journal article questioned BYD's ability to launch the e6 anytime soon, claiming it had not yet passed Chinese safety tests. BYD refuted this claim, noting that the e6 had passed all safety tests but the firm was still waiting for the results to be announced by the National Development and Reform Commission (NDRC). Our contact at BYD acknowledged that the e6 launch had been postponed from its original date in December 2009, citing a request by the Shenzhen municipal government that the e6 vehicle color match that of city taxicabs as the reason for the delay.

CATCH 22: MUST REACH SCALE TO LOWER PRICE

¶ 16. (SBU) BYD managers are optimistic about the launch of the e6 and the long-term prospects for electric vehicles (EVs). At the same time, company representatives point out that EV manufacturers in China still face significant obstacles; namely, achieving scale to bring down battery size and costs, the lack of battery charging stations, and consumer safety concerns. The principal challenge, according to a high-level BYD manager, is bringing down the size and cost of the battery to lower the price. However, EV manufacturers like BYD need to sell more vehicles in order to achieve the scale of production that would lower the price.

¶ 17. (SBU) Whereas company representatives are confident that purchases of EVs by celebrities and environmentally-aware young professionals will provide an early boost to sales, BYD is not

certain these initial sales will be sufficient to reach the scale necessary to bring down battery price and attract more buyers. One company manager advocated government subsidies targeted at individual EV purchasers and public education to increase environmental awareness as the most effective methods for increasing sales to achieve scale.

WEAK BATTERY CHARGING INFRASTRUCTURE, SAFETY CONCERNS

¶8. (SBU) The lack of battery recharging stations is another challenge to the growth of the EV market. Many urban dwellers in China live in apartment buildings and do not have access to an outlet where an EV could be charged. Moreover, in order to charge up quickly, EVs like the e6 would need to be charged at special "fast-charge" stations, which currently exist only as demonstration projects. An additional challenge relates to consumer perception that batteries are unsafe. This perception stems from reports that lithium ion batteries used in consumer electronics like laptops -- which have chemical properties similar to the battery used in the Chevy Volt and other EVs -- may rupture and explode under high temperatures. BYD representatives contend that the "Fe" battery is much safer than traditional lithium ion batteries and that its chemical compounds are stable up to 700 degrees Celsius. They also claim that the LiFePO4 battery is more energy efficient and is made up of compounds that can be easily sourced locally and recycled.

INCREASE VIABILITY OF SOLAR AND WIND, ADDRESS PEAK DEMAND

¶9. (SBU) Given that the transportation sector generates 6% of China's total greenhouse gas (GHG) emissions, a large-scale

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transition to electric vehicles would represent a significant reduction in the country's total emissions. BYD, however, claims that using its "Fe" battery technology to develop energy storage devices for use alongside solar panels and wind turbines will make an even greater contribution to emissions reduction. The company envisions its batteries could be used as anchors in a smart grid network in which solar and wind power are primary sources of energy at the neighborhood level. By storing surplus energy produced during high output intervals, batteries could stabilize power supplies from renewable energy sources. According to Chairman Wang, BYD is working with China Southern Power Grid to demonstrate the energy storage potential of its batteries at a 1 megawatt (MW) energy storage station in Shenzhen, and has plans for a similar station in Beijing.

¶10. (SBU) Managers at BYD also cite the potential for using stored energy in batteries to meet peak electricity demand, which is currently supplied by expensive and inefficient supplementary power plants that rely on fossil fuels. Batteries could be recharged during off-peak periods, when base load power generation is often higher than demand. As a result, power companies would be able to reduce total electricity production, resulting in a substantial decline in total emissions.

BYD LOOKING TO ENTER U.S. IN 2011, IPR ISSUES A CONCERN

¶11. (SBU) BYD intends to offer its e6 model in the U.S. market in late 2010 after a one-year trial period in China. The company also has plans to become a battery supplier for U.S. electric vehicle makers including GM. A top manager at BYD told Congenoff that the company does not consider itself a Chinese company but instead a "dual national" company because of Buffet's large stake. The same manager said that once demand for EVs picks up in the U.S. market, BYD has plans to set up a manufacturing plant that will "not only create job opportunities but also incorporate local design features." Comment: Although the e6 will likely compete in terms of cost with U.S.-made EVs, widely held concerns that BYD's success in the gasoline-powered car market in China is rooted in the

replication of other carmaker's designs may complicate the company's entry into the U.S. electric vehicle market. End Comment.

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